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ABSTRACT

Findings from a study to examine the relationship between school climate factors and student achievement in the Austin Independent School District are presented in this executive summary. Factor and regression analyses were used to analyze data from a survey of all public school professionals in the district. Findings suggested that differences in students' average achievement gains were related to their schools' learning and working conditions and that conditions related to student learning more strongly impacted achievement than did treatment of teachers as professionals or school discipline and management practices. The best predictor of student achievement was the percentage of school faculty willing to express displeasure with their school climate. Most faculty reported positive attitudes toward their schools' climates. Two tables are included. The appendix contains a list of survey items arranged by factor. (LMI)

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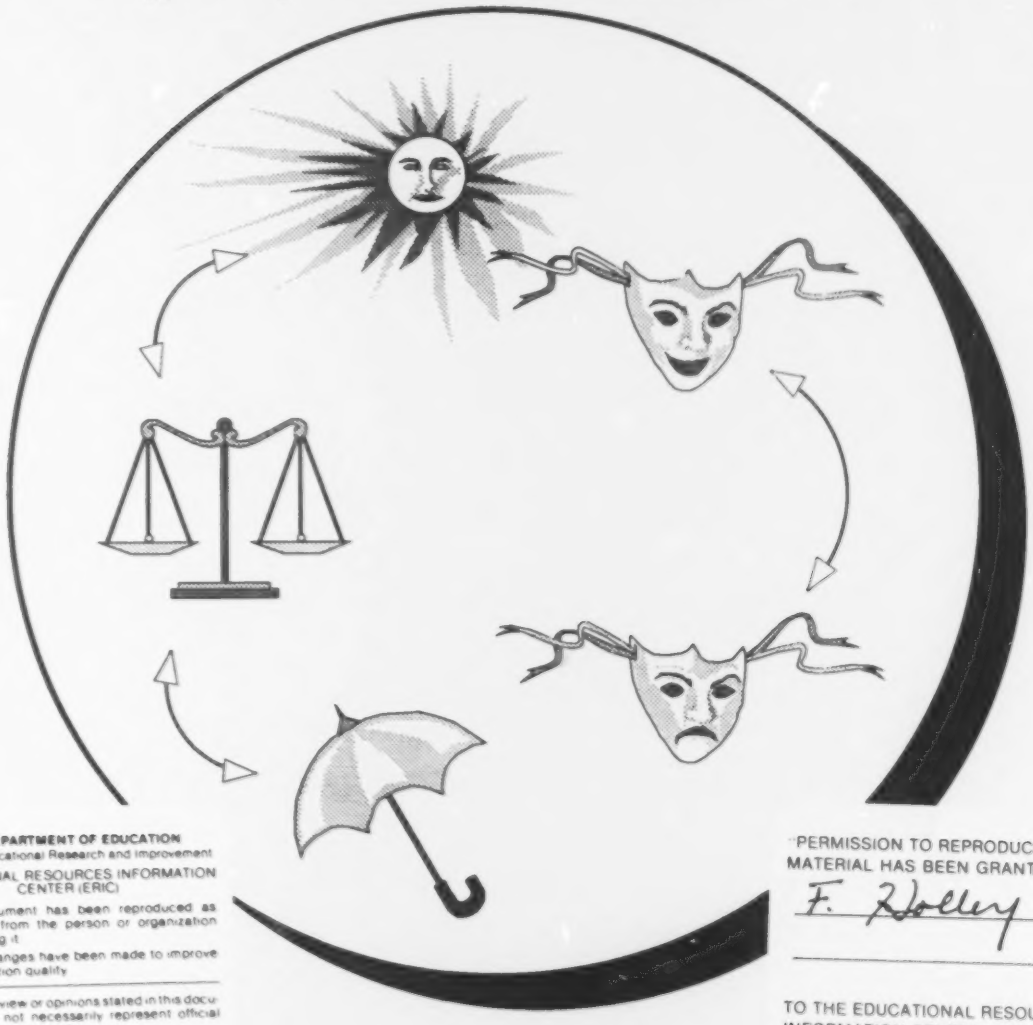

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School Climate and Student Achievement

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EA 023 395

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Austin Independent School District
Department of Management Information
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School Climate and Student Achievement

Executive Summary

Author: Vicente Paredes

Program Description

For the past three years the Office of Research and Evaluation has collected survey data concerning school climate. Since 1988-89, 24 survey items that were constructed to measure school climate have been administered to campus professionals. Professionals were asked to express their level of agreement with positive statements concerning the climate at their school.

The relationship between school climate and student achievement was investigated through the use of regression analysis. The regression analysis predicted average school achievement using items on the school climate survey. The average achievement score for a school was the average across grades of ROSE (Report on School Effectiveness) scores. A ROSE score is produced for each student which is adjusted for factors such as previous achievement, gender, ethnicity, income level, and age in grade. ROSE scores are computed using ITBS and TAP scores. Average scores were computed for the mathematics, reading, language, and work study skills subject areas.

Also, items on the survey were categorized into groups using a factor analysis. Three school climate subscale scores for each school were produced. These three subscale scores provide a more useful description of the dimensions of school climate measured by the survey than a single indicator.

Major Findings

- Responses from the past two years reveal that differences in the average achievement gains of students in a school are related to learning and working conditions at that school.
- The school climate items that focus upon conditions related to student learning are more strongly related to achievement than other items. Teacher concerns with their professional status and safety and behavior concerns are also related, but not as strongly.
- The best predictor of student achievement is the percent of faculty at a school willing to express displeasure with their school climate.
- Most responses to the survey were positive. Very few faculty expressed negative or strongly negative attitudes toward the climate at their school.
- A factor analysis divided the survey into the following subscales:

  (1) Items concerned with the teacher as a professional,

  (2) Items focusing upon the conditions conducive to student learning,

  (3) Items that focused upon safety and behavior concerns.

A copy of the full report for which this is the Executive Summary is available as Publication Number 90.49 from:
Austin Independent School District
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Introduction

"...many people believe that school climate makes a difference in how students learn."

The belief that a school's environment or atmosphere can affect student achievement is widely held. In other words, many people believe that school climate makes a difference in how students learn. At one time, researchers studying school effects thought that after student characteristics were factored out, there was little difference among schools. But more recent research on the unique effects of different school environments has supported the contention that school characteristics do make a difference. Current research efforts are directed at identifying effective schools and their characteristics. At the same time, programs to make schools more effective are being implemented, in many cases without the benefit of research results (Good & Brophy, 1986).

For the past three years, the Office of Research and Evaluation has administered a school climate survey to all campus professional staff. This survey is intended to provide information to school faculty and administrators concerning the environment at each individual school in the Austin Independent School District. This report analyzes teachers' responses to the survey. For more information concerning school climate and other survey results see ORE Publication No. 90.31, AISD on AISD: Reflections on the State of the District--1990-91 Districtwide Surveys.

This study is intended to refine our understanding of the specific factors related to school climate that affect student achievement. Many of the factors related to student achievement are, in fact, out of the school's direct control. Variables such as the economic status of students, parent literacy and parent attitudes toward education are some factors that play a great part determining the quality of student learning at a school and are not under the direct control of school staff.

It is also becoming clear that effective schools must be defined within a local context. No one style or structure will work in all communities. School staff, with the leadership of the school principal, can shape a unique school culture such that student learning will be enhanced.

"...one goal of this study is to look for school climate factors that are related to student achievement..."

Therefore, one goal of this study is to look for school climate factors that are related to student achievement in the Austin Independent School District. If specific environmental factors related to student achievement can be identified, then school staff involved in site-based improvement efforts might use this information to improve the achievement of students. This more specific knowledge of school climate factors that affect achievement will enable school staff to evaluate and adjust the conditions at their school in a more effective manner. This information may also be used to improve the general morale and working conditions of the faculty.

"...the survey might be refined to provide more useful and accurate information."

Another goal of this research is to improve and fine tune the survey process. The school climate survey should provide information that is comparable from one year to the next so that schools might check their progress toward goals. It is also desirable that some items on the survey be comparable to national samples. Another important concern is that the information provided by the survey be useful and measure desired factors in an intentional manner. With the results of this study, the survey might be refined to provide more accurate and useful information. Also, it might be possible to shorten the survey and at the same time improve the quality of information obtained.

Summary of Findings

The school climate survey as currently constructed measures at least three distinct dimensions of the school environment. These dimensions include variables such as the treatment of teachers as professionals, the learning environment, the safety of the school, and the behavior of students.

"...differences...are related to the learning and working conditions at that school."

In general, this study found that differences in the average achievement gains of students in a school are related to the learning and working conditions at that school. In other words, at schools where there is a positive school climate there is also a higher rate of learning. Positive school climate means here that teachers in a school thought that they were treated as professionals, that conditions in the school were conducive to student learning, and that the school was safe and the students well behaved.

"...items...related to student learning are the items most strongly related to student achievement."

Although all aspects of school climate are important to faculty, the school climate items that focus upon conditions related to student learning are the items most strongly related to student achievement. Teacher concerns with their professional status and with the safety and behavior of students are also related to student achievement but not as strongly as concern with instructional issues.

Method

I. Factor Analysis

Two major methods of analysis were used to meet the above goals. First, a factor analysis was performed to explore the relationship between survey items. Then a regression analysis was performed to investigate the relationship between school climate and student achievement.

Factor analysis is a statistical method that looks for patterns in data. This method of analysis attempts to cluster like items on the survey into categories based upon how the respondents answered the questions (Cliff, 1987). Clusters of like items are formed by detecting similarities among different persons' responses to items. For example, item number 1 would be clustered with items 2, 3, and 4 if a group of teachers responding in a positive manner to item 1 also responded in a positive manner to items 2, 3, and 4. Likewise, in order for item 1 to be part of the cluster, teachers responding in a negative manner to item 1 must also tend to respond in a negative manner to items 2, 3, and 4.

Factor analysis, unlike other statistical methods, does not require prior hypotheses. The common factors method was used. This method looks for hypothetical constructs underlying the data. The assumption here is that the school climate survey measures more than one discrete factor (but not in a perfect manner).

Identification of the underlying factors can be useful in two distinct ways. First, the factors can be used in reporting results to schools. Instead of reporting one number for the whole survey, a number for each subscale of the survey can be reported. This would make the information more useful in determining specific areas of strength and weakness in a school that affect school climate and in developing prescriptions for change. Second, these subscale scores can be correlated with ROSE and other indicators. This might give us a better idea of what components of school climate most affect achievement as measured by ROSE or other indicators of interest.

II. Regression Analysis

A regression analysis was also performed on the data. ITBS and TAP scores were examined in relation to school climate variables to see if there was a predictive relationship in AISD between school climate, as reported by teachers, and student achievement (in terms of standardized tests). Various forms of school climate scores were used in the analysis to see if one in particular would best predict achievement. The following predictors were examined: factor scores, item subscale scores, mean item scores, and response percentage scores (e.g. percent strongly disagree at a particular location).

Factor scores were correlated with a ROSE composite score for each school. Also individual items on the survey were correlated with the ROSE composite score. ROSE scores are usually reported by grade level. Composite ROSE scores were formed by averaging across grade levels.

ROSE scores are a transformation of ITBS and TAP scores. For each student, a ROSE score is produced that adjusts for factors such as previous achievement, gender, ethnicity, income level, and age in grade. This score is expressed as a residual. This residual is the difference between the student's actual score and the score that a student with similar characteristics would be predicted to achieve.

III. Scores

An important point to remember when considering the results of this study is that this and many previous studies set a narrow definition of student learning. Student learning as defined here is measured by a standardized achievement test and does not, for example, include much learning in the social, motivational, and aesthetic areas.

The following numerical assignments for the survey responses were used: strongly agree (2), agree (1), disagree (-1), strongly disagree (-2). This method assumes that there is a larger jump from agree to disagree than there is from, for example, agree to strongly agree. There is no neutral response possible on the school climate survey, but an average of responses for a group of individuals might be neutral.

For each individual, factor scores can be computed. These factor scores indicate how strongly the individual reflects the factor in his or her responses. In factor analysis we can only estimate the true factor scores. The true factor scores are standardized, that is, they have a mean of zero and a variance of one. The estimated scores have a mean of zero but a variance (and standard deviation) of less than one. We can obtain a good estimate of school climate for each location by averaging the factor scores for the individuals at a particular location.

Another way to report scores for each individual is to simply average the responses for the items in each factor. An indicator for each school can be formed by averaging across individuals.

Results

I. Factor Analysis Results

Three factors were extracted from the analysis. These can be seen as subscales of the survey. Included in this report is a listing of the factors by item (Attachment A). Factor loadings for each item (similar to a correlation coefficient) are given in parentheses after each item. The three factors have been given labels on the basis of a qualitative review of the items. These factors are:

Factor I: The focus is on the teacher as a professional. It includes items related to job climate, school leadership, and working conditions.

Factor II: The focus is on student learning. Items are related to conditions conducive to learning and achievement.

Factor III: The focus is on discipline and management. Safety and student behavior concerns are included in this factor.

The items in factor III are not as cohesive as the other factors. Items in this factor should be revised if they are to be included in the future. Factor I could be refined by making some items more focused or by dropping some items from the survey. Items in factor II, those concerned with conditions conducive to student learning, should be examined to determine if the information is specific enough to be useful to school staff. Other questions could also be eliminated or revised to make the survey more focussed upon specific objectives and to make it shorter.

II. Regression Analysis Results

The best predictor of ROSE results was not a mean score, but the percent of teachers who strongly disagreed with the positively worded items. This indicates that the best predictor is not the average attitude of the faculty or, the number of faculty that are satisfied with their school climate. The best predictor turns out to be the percent of faculty at a school willing to express displeasure with their school climate. After examining the distribution of responses, it was found that most responses were positive. Relatively few faculty expressed negative or strongly negative attitudes toward the climate at their school.

Using the percent strongly disagree indicator, the 24 items on the survey correlated with ROSE scores as follows:

	r
Reading	.76
Mathematics	.71
Language	.79
Work/Study Skills	.56

A correlation of 1.00 represents a perfect relationship between two variables. Correlations above .40 are usually considered to be strong relationships, especially in educational research.

Mean factor scores were correlated with ROSE to see which factors, if any, were most strongly related to achievement. As illustrated by the table below, factor 1 does not seem to be highly related to ROSE scores. But factors 2 and 3 do show significant correlations. No factor correlated significantly with mathematics scores, but factor 2 showed significant correlations for reading, language, and work/study skills. Results also indicate that factor 2 has a curvilinear component. The table below shows correlations among ROSE scores and factor scores as well as correlations among ROSE scores and cubed factor scores.

	Mathematics	Reading	Language	Work/Study
factor 1	.15	.16	.14	-.005
factor 2	-.05	.33*	.21*	.22*
factor 3	-.04	.33*	.23*	.16
(factor 1)^3	.15	.17	.20	.04
(factor 2)^3	-.15	.39*	.30*	.26*
(factor 3)^3	-.07	.27*	.17	.14

* indicates significance a the .05 level

The correlations shown above are not strong. This is consistent with other results, stated previously, that the best predictor of ROSE scores is the number of faculty willing to express displeasure with the school climate and not a mean score. This also indicates that the survey could be refined to more strongly reflect these factors. Revising survey items might produce measures more strongly related to student achievement. But the results do indicate that factor 2, the one concerned with conditions conducive to student learning, is the factor most strongly related to ROSE scores.

References:

Cliff, N. (1987). Analyzing Multivariate Data. Harcourt Brace Jovanovich: San Diego.

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ATTACHMENT A
ITEMS ARRANGED BY FACTOR

Factor loadings are given in parentheses. Items that load strongly on another scale are also indicated.

Factor I: Teachers as professionals

- The principal is willing to discuss problems with professionals. (.77)
- My decisions as a professional are supported and respected by my campus administrator(s). (.76)
- The channels of communication among the faculty, administrators, and other staff at my building are open and adequate. (.71)
- The resolution of conflict or problems is addressed positively in my school. (.71)
- There is collaborative planning and decision making in my school. (.64, II:.40)
- Staff achievements are recognized. (.62)
- The morale of this staff is generally high. (.61)
- Job performance appraisals on this campus are fair and representative of actual job performance. (.59)
- Our faculty meetings are well planned and productive. (.59)
- New school policies are explained to me to my satisfaction. (.58)
- My continued growth as a professional is supported by staff development/ training provided through my campus. (.51)
- An effort is made to keep paperwork required by my campus to a minimum level. (.49)

ATTACHMENT A
ITEMS ARRANGED BY FACTOR

Factor II: Goals for student learning

- Our school staff believes and demonstrates that all students can attain mastery. (.65)
- Our school staff has high expectations for success. (.62)
- Our school has a clear and focused mission through which our entire staff shares an understanding and commitment to school goals. (.61)
- Our school staff works together to improve instruction. (.59)
- At our school there is frequent monitoring of student progress. The results of assessments are used to improve individual student proficiency. (.57)
- Our classrooms are characterized by students actively engaged in learning. (.54, III:.41)
- Our school has positive relations with the home and school community. (.42, III:.39)

Factor III: School discipline and management

- Overall, students are well behaved in this school. (.64)
- Our school has a safe climate. (.61)
- Our school has an orderly, purposeful, businesslike climate. (.61)
- The general school climate is conducive to learning. (.61, II:.42)

The following item did not correlate highly with any of the factors:

- Adequate resources (e.g., textbooks, teacher guides, and other materials) are available to me.

Austin Independent School District

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